

REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1, 4, 6-9, 12, 15, 17-20, 22, and 23 are pending in this case, Claims 2-3, 5, 10-11, 13-14, 16, and 21 are canceled by the present amendment, and Claims 1, 4, 6-9, 12, 15, 17-20, 22, and 23 are amended by the present amendment. Amended Claims 1 and 12 are supported by the specification.¹ Amended Claims 4, 6-9, 15, 17-20, 22, and 23 are supported by the original claims. Amended Claims 1, 4, 6-9, 12, 15, 17-20, 22, and 23 add no new matter.

The outstanding Official Action objected to Claims 5-9 and 17-20 under 37 C.F.R. §1.75(c) as in improper form. Claims 1, 10-12, and 21-23 were rejected under 35 U.S.C. §103(a) as unpatentable over Masayuki (Japanese Patent Publication No. 08-094886) in view of Kiryuscheva et al. (United States Patent No. 5,859,947, herein "Kiryuscheva"). Claims 2-4 and 13-16 were rejected under 35 U.S.C. §103(a) as unpatentable over Masayuki in view of Kiryuscheva and further in view of Catanzaro et al. (United States Patent No. 5,790,283, herein "Catanzaro").

An interview was held on February 11, 2004 to discuss the present case, attended by Examiner Tremblay, Ed Tracy, and Raymond Cardillo, Jr. Applicants would like to thank the examiner for his time in conducting the interview. The differences between the amended claims and the cited references were discussed in detail. Arguments based on these discussions are presented below.

In response to the objection to Claims 5-9 and 17-20, Claim 5 is canceled and Claims 6-7 and 17-18 are amended to depend from a single claim. Accordingly, the objection to

¹ See specification at page 26, line 31 to page 27, line 29.

Claim 5 is believed to be moot and the objection to Claims 6-9 and 17-20 is believed to be overcome.

Claims 1, 10-12, and 21-23 were rejected under 35 U.S.C. §103(a) as unpatentable over Masayuki in view of Kiryuscheva. Claims 10-11 and 21 are canceled, making the present rejection moot with respect to these claims. To the extent that the present rejection applies to amended independent Claims 1 and 12, applicant respectfully traverses the rejection.

Amended independent Claim 1 recites:

an adjustment apparatus configured to output control signals which, according to a genetic algorithm, make adjustment of parameters of a stipulated plurality of optical elements among said plurality of optical elements and which search for optimal parameter values at which functions of said optical apparatus satisfy stipulated specifications;

a memory that stores a plurality of pairs of parameter values measured during the adjustment of the parameters by said control signals and observation values of output light obtained simultaneously with measurement of said pairs of parameter values; and

means for selecting among said plurality of pairs a pair which has a largest evaluation value and replacing a solution candidate of the genetic algorithm with the parameter values of the selected pair.

As noted during the February 11, 2004, discussion with the examiner, Masayuki discloses a method for adjusting an optical axis of an optical module. The method approximates the space power characteristic of optical coupling with a Gaussian function. The method is a deterministic method, i.e. the method will always generate the same result when acting on the same inputs. There is no teaching or suggestion to substitute a genetic algorithm that incorporates a random element² such that a different result can be reached when operating on the same input for the Masayuki deterministic method noted above.

² As noted in response to the examiner's question at the above-noted discussion on February 11, 2004, the inclusion of a random element is disclosed to be an inherent feature of the claimed genetic algorithm.

Kiryuscheva discloses a method and apparatus for aligning an optical fiber with an optical beam. Kiryuscheva teaches at column 12, line 41 to column 13, line 33 that a human operator carries out the alignment process. There is no teaching or suggestion to use an automatic adjustment mechanism, either deterministic or probabilistic.

Catanzaro discloses a method for optimizing the overlap of a holographic lens array. Catanzaro does suggest the use of a genetic algorithm for optimizing the overlap of a holographic lens array, but does not teach or suggest the use of a genetic method for any other purpose.

“In order to rely on a reference as a basis for rejection of an applicant’s invention, the reference must either be in the field of applicant’s endeavor, or, if not, be reasonably pertinent to the particular problem with which the inventor was concerned.” *In re Oetiker*, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992), see also MPEP §2141.01(a). In the present case, and as noted during the above-noted discussion of February 11, 2004, applicant respectfully submits that the Catanzaro reference is non-analogous art. Catanzaro is clearly not in applicant’s field of endeavor and does not disclose a solution to the problem of misalignment of a plurality of optical components in an optical apparatus.

“A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor’s endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor’s attention in considering his problem.” *In re Clay*,²³ USPQ2d 1058, 1061 (Fed. Cir. 1992), see also MPEP §2141.01(a). Applicant submits that the structure and function of the apparatus disclosed by Catanzaro is very different from the structure and function of the present invention and that the matter with which Catanzaro deals would not logically commend itself to anyone’s attention in considering the above-noted problem of concern.

Instead, Catanzaro discloses an apparatus for manufacturing a substrate having a high density of vias therein by using an overlapping holographic lens array. The present invention solved the problem of automatically and efficiently realigning a plurality of optical components in an optical apparatus after misalignment occurs. There is no disclosure in Catanzaro regarding finding an optimal configuration of a plurality of optical components to maximize the performance of an optical apparatus. Catanzaro does not consider the problem solved by the present invention, much less suggest a solution for it. Thus, one skilled in the art would not look to the Catanzaro reference for guidance in solving the problem solved by the present invention.

Accordingly, applicant respectfully submits that Catanzaro is non-analogous art with respect to the claimed invention. Use of such non-analogous art is insufficient to present a *prima facie* case of obviousness. See *In re Oetiker* at 1446. See also *In re Clay* at 1061.

A *prima facie* case of obviousness further requires that all claim limitations are taught or suggested by the cited references. See *In re Vaeck*, 20 USPQ2d 1438 (Fed. Cir. 1991) and MPEP §2142. Applicant respectfully submits that the cited references do not teach or suggest an adjustment apparatus configured to output control signals which, according to a genetic algorithm, make adjustment of parameters of a stipulated plurality of optical elements among said plurality of optical elements and which search for optimal parameter values at which functions of said optical apparatus satisfy stipulated specifications, a memory that stores a plurality of pairs of parameter values measured during the adjustment of the parameters by said control signals and observation values of output light obtained simultaneously with measurement of said pairs of parameter values; or means for selecting among said plurality of pairs a pair which has a largest evaluation value and replacing a solution candidate of the genetic algorithm with the parameter values of the selected pair, as recited in Claim 1.

As stated above, there is no teaching or suggestion of any kind in Masayuki or Kiryuscheva for an adjustment apparatus configured to execute a genetic algorithm. In fact, there is no teaching or suggestion to use a probabilistic method of any kind in Masayuki or Kiryuscheva. Assuming *arguendo* that Catanzaro is analogous art that can be used in a §103 rejection, Catanzaro does not teach or suggest an adjustment apparatus configured to output control signals which, according to a genetic algorithm, make adjustment of parameters of a stipulated plurality of optical elements among said plurality of optical elements and which search for optimal parameter values at which functions of said optical apparatus satisfy stipulated specifications, as recited in Claim 1. Although Catanzaro does mention the use of genetic algorithms, it does not suggest the use of a genetic algorithm in an apparatus for adjusting a plurality of optical elements. Thus, an adjustment apparatus configured to output control signals which, according to a genetic algorithm, make adjustment of parameters of a stipulated plurality of optical elements among said plurality of optical elements and which search for optimal parameter values at which functions of said optical apparatus satisfy stipulated specifications, as recited in Claim 1, is not taught or suggested by the cited references.

Further, none of the cited references teach or suggest a memory that stores a plurality of pairs of parameter values measured during the adjustment of the parameters by said control signals and observation values of output light obtained simultaneously with measurement of said pairs of parameter values; or means for selecting among said plurality of pairs a pair which has a largest evaluation value and replacing a solution candidate of the genetic algorithm with the parameter values of the selected pair, as recited in Claim 1. Thus, applicant respectfully submits that Claim 1 is patentable over the cited references.

Amended independent Claim 12 recites similar elements to Claim 1. Applicant respectfully argues that Claim 12 is patentable over the cited references for the reasons discussed above with respect to Claim 1.

Claims 2-4 and 13-16 were rejected under 35 U.S.C. §103(a) as unpatentable over Masayuki in view of Kiryuscheva and further in view of Catanzaro. Claims 2-3, 13-14, and 16 are canceled, making the present rejection moot with respect to these claims. To the extent that the present rejection applies to amended Claims 4 and 15, applicant respectfully traverses the rejection for the reasons presented above as to respective independent Claims 1 and 12. In addition, each of dependent Claims 4 and 15 add further features not taught or suggested by the applied references and are further believed to be patentable for this reason as well.

Claims 6-9 are dependent from Claim 1 and are believed to be patentable over the cited references for the reasons noted above as to parent Claim 1. In addition, Claims 6-9 add further features not taught or suggested by the applied references and are further believed to be patentable for this reason as well.

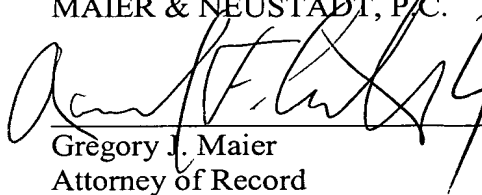
Claims 17-20, 22, and 23 are dependent from Claim 12, and are believed to be patentable over the cited references for the reasons noted above as to parent Claim 12. In addition, Claims 17-20, 22, and 23 add further features not taught or suggested by the applied references and are further believed to be patentable for this reason as well.

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Reply to Office Action of October 17, 2003

Accordingly, the outstanding rejections are traversed and the pending claims are believed to be in condition for formal allowance. An early and favorable action to that effect is, therefore, respectfully requested.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read 'Gregory J. Maier', is written over a horizontal line.

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